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Development and psychometric evaluation of the Motivation to Use CPAP Scale (MUC-S) using factorial structure and Rasch analysis among patients with obstructive sleep apnea before CPAP treatment is initiated

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Abstract

Background Continuous positive airway treatment (CPAP) is first-line treatment for obstructive sleep apnea (OSA), but adherence tends to be low. A clinical tool focusing on motivation to use CPAP is missing. The purpose was to develop a brief questionnaire to assess motivation to use CPAP that is psychometrically robust and suitable for use in clinical practice.

Methods A convenience sample including 193 treatment naive patients with OSA (67% men; mean age = 59.7 years, SD 11.5) from two CPAP clinics was used. Clinical assessments and full night polygraphy were performed. Questionnaires administered before CPAP treatment included the newly developed Motivation to Use CPAP Scale (MUC-S), Minimal Insomnia Symptoms Scale (MISS), Epworth Sleepiness Scale (ESS), and Attitude towards CPAP treatment Inventory (ACTI). The validity and reliability of the MUC-S were investigated using Rasch and exploratory factor analysis models. Measurement invariance, dimensionality and differential item functioning (i.e., across gender groups, excessive daytime sleepiness (ESS), insomnia (MISS) and attitude towards CPAP (ACTI) groups) were assessed.

Results The results supported a two-factor solution (autonomous motivation, 6 items, factor loadings between 0.61 and 0.85 and controlled motivation, 3 items, factor loadings between 0.79 and 0.88) explaining 60% of the total variance. The internal consistency was good with Cronbach's alpha of 0.88 and 0.86 for the two factors. No differential item functioning was found. A latent class analysis yielded three profiles of patients with high ($n = 111$), moderate ($n = 60$) and low ($n = 22$) motivation. Patients with high motivation were older, had higher daytime sleepiness scores, more insomnia symptoms and a more positive attitude towards CPAP.

Conclusions The MUC-S seems to be a valid tool with robust psychometric properties suitable for use at CPAP clinics. Future studies should focus on how motivation changes over time and if MUC-S can predict objective long-term CPAP adherence.

Keywords Obstructive sleep apnea · Continuous positive airway treatment · Ethos · Validity · Reliability

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